CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A DC/DC converter for managing high voltage gain, the converter comprising:

an input side having a high tap and a low tap;

an output side having a high tap and a low tap;

a converter circuit interconnecting said input side and said output side; and

a steering branch having at least one rectifier and one of at least one winding and a capacitor, said steering branch interconnecting said input side with said output side.

2. A DC/DC converter according to claim 1, wherein said converter circuit is selected from buck, boost, buck-boost, Cuk, Sepic, Zeta, half bridge boost for low-line input, half bridge boost for high-line input, and half bridge boost for universal-line input.

3. A DC/DC converter according to claim 1, wherein said steering branch includes a rectifier in series with a winding.

4. A DC/DC converter according to claim 3, wherein said converter circuit is a buck converter; and wherein said rectifier is connected to said low tap of said input side and said low tap of said output side, and said winding is connected to said high tap of said output side.

5. A DC/DC converter according to claim 3, wherein said converter circuit is a boost converter; and wherein said winding is connected to said

high tap of said input side, and said rectifier is connected to said high tap of said output side.

6. A DC/DC converter according to claim 3, wherein said converter circuit is a buck-boost circuit; and wherein said winding is connected to said low tap of said output side, and said rectifier is connected to said high tap of said output side.

7. A DC/DC converter according to claim 1, wherein said steering branch includes a rectifier having an input node and an output node, said rectifier connected in series at the output node of said rectifier with a pair of windings, and each of said pair of windings having an input node and an output node.

8. A DC/DC converter according to claim 7, wherein said converter circuit is a Cuk converter; and wherein said output node of said rectifier is connected to both said low tap of said input side and said low tap of said output side, said input node of a first winding of said pair of windings is connected to said high tap of said input side, and said output node of a second winding of said pair of windings is connected to said high tap of said output side.

9. A DC/DC converter according to claim 7, wherein said converter circuit is a Sepic converter; and wherein said output node of said rectifier is connected to said high tap of said output side, said input node of a first winding of said pair of windings is connected to said high tap of said input side, and said output node of a second winding of said pair of windings is connected to both said low tap of said input side and said low tap of said output side.

10. A DC/DC converter according to claim 1, wherein said converter circuit is a Zeta converter; and wherein said output node of said rectifier is connected to both said low tap of said input side and said low tap of said output side, said output node of a first winding of said pair of windings is connected to both said low tap of said input side and said low tap of said output side, and said output node of a second winding of said pair of windings is connected to said high tap of said output side.

11. A DC/DC converter according to claim 1, wherein said steering branch includes a winding having an input node and an output node, said winding connected in series at said output node with a pair of rectifiers, each of said pair of rectifiers having an input node and an output node.

12. A DC/DC converter according to claim 11, wherein said output node of a first rectifier of said pair of rectifiers is connected to said high tap of said output side, and said input node of a second rectifier of said pair of rectifiers is connected to said low tap of said output side.

13. A DC/DC converter according to claim 12, wherein said converter circuit is selected from a half bridge boost circuit for low-line input, a half bridge boost circuit for high-line input, and a half bridge boost circuit for universal-line input.

14. A DC/DC converter according to claim 1, wherein said steering branch includes a capacitor connected to a rectifier, said capacitor having an input node and an output node, and said rectifier having an input node and an output node.

15. A DC/DC converter according to claim 14, wherein said converter circuit is a boost converter having center node joining a first inductor a

second inductor and a switch, said first inductor connected to said high tap of said input side, and said second inductor connected to an output rectifier, said output rectifier connected to said high tap of said output side.

16. A DC/DC converter according to claim 14, wherein said rectifier of said steering branch interconnects said center node with said second inductor, and said capacitor of said steering branch interconnects said high tap of said input side with both said second inductor and said rectifier of said steering branch.

17. A DC/DC converter according to claim 14, wherein said rectifier of said steering branch interconnects said center node with said second inductor, and said capacitor of said steering branch interconnects both of said low tap of said input side with said low tap of said output side with both of said rectifier of said steering branch and said second inductor.

18. A DC/DC converter according to claim 14, wherein said converter circuit is a buck-boost converter having a node connected to an output rectifier, said first node joining a magnetizing inductor and said high tap of said input side; and wherein said rectifier of said steering branch interconnects said first node with said output rectifier, said capacitor of said steering branch interconnects said low tap of said output side with both of said rectifier of said steering branch and said output rectifier.

19. A DC/DC converter according to claim 14, wherein said converter circuit is a Sepic converter having a center node connected to an output rectifier, said center node joining a capacitor with a first inductor, said first inductor connected to both of said low tap of said input side and said low tap of said output side, said capacitor connected to a second inductor, said second inductor connected to said high tap of said input side; and wherein

said rectifier of said steering branch interconnects said center node with said output rectifier, and said capacitor of said steering branch interconnects both of said low tap of said input side and said low tap of said output side with both of said output rectifier and said rectifier of said steering branch.